



DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2022-1152; Project Identifier MCAI-2022-00260-T; Amendment 39-22323; AD 2023-02-16]

RIN 2120-AA64

Airworthiness Directives; BAE Systems (Operations) Limited Airplanes

AGENCY: Federal Aviation Administration (FAA), Department of Transportation (DOT).

ACTION: Final rule.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for certain BAE Systems (Operations) Limited Model Avro 146-RJ series airplanes. This AD was prompted by a report that certain inertial reference units (IRUs) have out-of-date magnetic variation (MagVar) tables. This AD requires assessing the values between the MagVar tables of the affected IRUs and the most recently published MagVar data tables, and corrective actions if necessary. The FAA is issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES:

AD Docket: You may examine the AD docket at [regulations.gov](https://www.regulations.gov) under Docket No. FAA-2022-1152; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday

through Friday, except Federal holidays. The AD docket contains this final rule, the mandatory continuing airworthiness information (MCAI), any comments received, and other information. The address for Docket Operations is U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

Material Incorporated by Reference:

- For service information identified in this final rule, contact BAE Systems (Operations) Limited, Customer Information Department, Prestwick International Airport, Ayrshire, KA9 2RW, Scotland, United Kingdom; telephone +44 1292 675207; fax +44 1292 675704; email RAPublications@baesystems.com; website regional-service.com.

- You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206-231-3195. It is also available at regulations.gov under Docket No. FAA-2022-1152.

FOR FURTHER INFORMATION CONTACT: Todd Thompson, Aerospace Engineer, Large Aircraft Section, International Validation Branch, FAA, 2200 South 216th St., Des Moines, WA 98198; telephone: 206-231-3228; email Todd.Thompson@faa.gov.

SUPPLEMENTARY INFORMATION:

Background

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to certain BAE Systems (Operations) Limited Model Avro 146-RJ airplanes. The NPRM published in the *Federal Register* on November 16, 2022 (87 FR 68644). The NPRM was prompted by AD G-2022-0005, dated February 24, 2022, issued by United Kingdom Civil Aviation Authority (U.K.

CAA), which is the aviation authority for the United Kingdom (U.K. CAA AD G-2022-0005) (referred to after this as the MCAI). The MCAI states that the navigation system for Model Avro 146-RJ series airplanes has an inertial reference system (IRS) that uses true north to calculate magnetic heading and track. The IRS includes IRUs with MagVar data tables that correct the heading/track for the effects of magnetic variation. Due to the change in the location of magnetic north over time, the level of IRS accuracy diminishes in certain geographical locations if an IRU's MagVar data table is not kept up to date with current WMM MagVar data tables. Consequently, certain airplanes may have IRUs with MagVar tables that are out of date and which can lead to inaccurate heading, course and bearing calculations. This condition, if not corrected, may result in an increased risk of controlled flight into terrain, or collision with another airplane, possibly resulting in damage to the airplane and injury to occupants.

In the NPRM, the FAA proposed to require assessing the values between the MagVar tables of the affected IRUs and the most recently published MagVar data tables, and corrective actions if necessary. The FAA is issuing this AD to address the unsafe condition on these products.

You may examine the MCAI in the AD docket at [regulations.gov](https://www.regulations.gov) under Docket No. FAA-2022-1152.

Discussion of Final Airworthiness Directive

Comments

The FAA received no comments on the NPRM or on the determination of the cost to the public.

Conclusion

This product has been approved by the aviation authority of another country and is approved for operation in the United States. Pursuant to the FAA's bilateral agreement with this State of Design Authority, it has notified the FAA of the unsafe condition

described in the MCAI referenced above. The FAA reviewed the relevant data and determined that air safety requires adopting this AD as proposed. Accordingly, the FAA is issuing this AD to address the unsafe condition on this product. Except for minor editorial changes, this AD is adopted as proposed in the NPRM. None of the changes will increase the economic burden on any operator.

Related Service Information under 1 CFR Part 51

BAE Systems has issued All Operator Message 21-011V-1, Issue 1, dated September 27, 2021. This service information describes, among other actions, procedures for assessing the accuracy of an affected IRU's MagVar data table when compared to the current World Magnetic Model (WMM) MagVar data tables, and corrective actions if the MagVar is greater than 2 degrees. The corrective actions include either updating an affected IRU's MagVar data tables, or operating an airplane only if the terrain awareness warning system (TAWS) and traffic collision avoidance system (TCAS) are installed and operative, and revising the operator's FAA-approved minimum equipment list (MEL) to prohibit dispatch unless both TAWS and TCAS are installed and operative. BAE Systems All Operator Message 21-011V-1, Issue 1, dated September 27, 2021, also specifies that updating the data tables would terminate the MEL prohibition provided the airplane has operative TAWS and TCAS.

This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in the ADDRESSES section.

Costs of Compliance

The FAA estimates that this AD affects 10 airplanes of U.S. registry. The FAA estimates the following costs to comply with this AD:

Estimated costs for required actions

Labor cost	Parts cost	Cost per product	Cost on U.S. operators
1 work-hour X \$85 per hour = \$85	\$0	\$85	\$850

The FAA has received no definitive data on which to base the cost estimates for the on-condition actions specified in this AD.

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

This AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

- (1) Is not a "significant regulatory action" under Executive Order 12866,
- (2) Will not affect intrastate aviation in Alaska, and

(3) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

The Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by adding the following new airworthiness directive:

2023-02-16 BAE Systems (Operations) Limited: Amendment 39-22323; Docket No. FAA-2022-1152; Project Identifier MCAI-2022-00260-T.

(a) Effective Date

This airworthiness directive (AD) is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

None.

(c) Applicability

This AD applies to BAE Systems (Operations) Limited Model Avro 146-RJ70A, 146-RJ85A, and 146-RJ100A airplanes, certificated in any category, equipped with Honeywell inertial reference unit (IRU) part number (P/N) HG2001BC02 or P/N HG2001BC04.

(d) Subject

Air Transport Association (ATA) of America Code 34, Navigation.

(e) Unsafe Condition

This AD was prompted by a report that certain IRUs have out-of-date magnetic variation (MagVar) tables. The FAA is issuing this AD to address IRUs having outdated MagVar lookup tables, which could lead to inaccurate inertial reference system calculations, possibly resulting in increased risk of controlled flight into terrain, or collision with another airplane and injury to occupants.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Definitions

For the purpose of this AD, the following definitions apply:

(1) Affected IRU: A Honeywell IRU having P/N HG2001BC02 using a MagVar lookup table from 1990, or P/N HG2001BC04 using a MagVar lookup table from 1995.

(2) WMM: World Magnetic Model, which is the standard model for navigation, altitude, and heading referencing systems using the geomagnetic field. The WMM is produced at 5-year intervals. The existing WMM as of November 16, 2022 was released December 10, 2019.

(h) Magnetic Variation Assessment

Within 3 months after the effective date of this AD, and thereafter at intervals not to exceed 5 years, assess the accuracy of an affected IRU's MagVar data table, in accordance with the Recommendations of BAE Systems All Operator Message 21-011V-1, Issue 1, dated September 27, 2021.

(1) If the difference between an affected IRU's MagVar data table and the existing WMM MagVar data tables is less than or equal to 2 degrees for the routes that the airplane may operate, no further action is required until the assessment is repeated, as required by the introductory text to paragraph (h) of this AD.

(2) If the difference between an affected IRU's MagVar data table and the existing WMM MagVar data tables is greater than 2 degrees for the routes that the airplane may operate: Do the actions required by paragraph (h)(2)(i) or (ii) of this AD.

(i) Within three months after the effective date of this AD or before further flight after the assessment in the introductory text to paragraph (h) of this AD, whichever occurs later: Update the airplane's affected IRU MagVar data tables in accordance with the Recommendations of BAE Systems All Operator Message 21-011V-1, Issue 1, dated September 27, 2021.

(ii) Comply with the provisions specified in, and at the times specified in, paragraphs (h)(2)(ii)(A) and (B) of this AD.

(A) Further flight is prohibited in areas where the difference between the installed and the existing MagVar values exceeds the 2 degree tolerance unless both terrain awareness warning system (TAWS) and traffic collision avoidance system (TCAS) are installed and operative.

(B) Before further flight, revise the operator's existing FAA-approved minimum equipment list (MEL) to prohibit dispatch unless both TAWS and TCAS are installed and operative.

(3) If an affected IRU's MagVar data table cannot be determined, follow the procedures specified in the Recommendations of BAE Systems All Operator Message 21-011V-1, Issue 1, dated September 27, 2021.

(4) This AD does not require operators to provide flightcrews with certain operating procedures as those actions are already required by existing FAA operating regulations (see 14 CFR part 91).

(i) Terminating Action for MEL Prohibition

Updating both affected IRUs, as specified in paragraph (h)(2)(i) of this AD, terminates the MEL prohibition specified in paragraph (h)(2)(ii)(B) of this AD, provided both TAWS and TCAS are installed and operative.

(j) Other FAA AD Provisions

The following provisions also apply to this AD:

(1) *Alternative Methods of Compliance (AMOCs)*: The Manager, International Validation Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or responsible Flight Standards Office, as appropriate. If sending information directly to the International Validation Branch, send it to the attention of the person identified in paragraph (k)(2) of this AD. Information may be emailed to: 9-AVS-AIR-730-AMOC@faa.gov. Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the responsible Flight Standards Office.

(2) *Contacting the Manufacturer*: As of the effective date of this AD, for any requirement in this AD to obtain instructions from a manufacturer, the instructions must be accomplished using a method approved by the Manager, International Validation Branch, FAA; or the UK CAA; or BAE Systems (Operations) Limited's UK CAA DOA. If approved by the DOA, the approval must include the DOA-authorized signature.

(k) Additional Information

(1) Refer to U.K. CAA AD G-2022-0005, dated February 24, 2022, for related information. This U.K. CAA AD may be found in the AD docket at [regulations.gov](https://www.regulations.gov) under Docket No. FAA-2022-1152.

(2) For more information about this AD, contact Todd Thompson, Aerospace Engineer, Large Aircraft Section, International Validation Branch, FAA, 2200 South

216th St., Des Moines, WA 98198; telephone 206-231-3228; email

Todd.Thompson@faa.gov.

(I) Material Incorporated by Reference

(1) The Director of the Federal Register approved the incorporation by reference of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless this AD specifies otherwise.

(i) BAE Systems All Operator Message 21-011V-1, Issue 1, dated September 27, 2021.

(ii) [Reserved]

(3) For service information identified in this AD, contact BAE Systems (Operations) Limited, Customer Information Department, Prestwick International Airport, Ayrshire, KA9 2RW, Scotland, United Kingdom; telephone +44 1292 675207; fax +44 1292 675704; email RApublications@baesystems.com; website regional-service.com.

(4) You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206-231-3195.

(5) You may view this service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, email fr.inspection@nara.gov, or go to: www.archives.gov/federal-register/cfr/ibr-locations.html.

Issued on January 27, 2023.

Christina Underwood, Acting Director,
Compliance & Airworthiness Division,
Aircraft Certification Service.

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